1600

RAW SEQUENCE LISTING   DATE: 09/22/2003
PATENT APPLICATION: **US/09/537,710C**   TIME: 13:26:07

Input Set : **N:\EBONY'S\US09537710C.RAW.txt**
Output Set: **N:\CRF4\09222003\I537710C.raw**

```
 1 <110> APPLICANT: Dahlquist, Anders
 2       Stahl, Ulf
 3       Lenman, Marit
 4       Banas, Antoni
 5       Ronne, Hans
 6 <120> TITLE OF INVENTION: A new class of enzymes in the biosynthetic pathway for the
production
 7       of
 8       triacylglycerol and recombinant DNA molecules encoding these enzymes
 9 <130> FILE REFERENCE: BASFnae337799PCT1-15
C--> 10 <140> CURRENT APPLICATION NUMBER: US/09/537,710C
11 <141> CURRENT FILING DATE: 2000-03-30
12 <150> PRIOR APPLICATION NUMBER: EP 99106656.4
13 <151> PRIOR FILING DATE: 1999-04-01
14 <160> NUMBER OF SEQ ID NOS: 19
15 <170> SOFTWARE: WordPerfect version 6.1
17 <210> SEQ ID NO: 1
18 <211> LENGTH: 1986
19 <212> TYPE: DNA
20 <213> ORGANISM: Saccharomyces cerevisiae
21 <220> FEATURE:
22 <221> NAME/KEY: CDS
23 <222> LOCATION: (1)..(1983)
24 <400> SEQUENCE: 1
25       atg ggc aca ctg ttt cga aga aat gtc cag aac caa aag agt gat tct    48
26       Met Gly Thr Leu Phe Arg Arg Asn Val Gln Asn Gln Lys Ser Asp Ser
27        1           5                  10                  15
28       gat gaa aac aat aaa ggg ggt tct gtt cat aac aag cga gag agc aga    96
29       Asp Glu Asn Asn Lys Gly Gly Ser Val His Asn Lys Arg Glu Ser Arg
30                   20              25                  30
31       aac cac att cat cat caa cag gga tta ggc cat aag aga aga agg ggt   144
32       Asn His Ile His His Gln Gln Gly Leu Gly His Lys Arg Arg Arg Gly
33               35              40                  45
34       att agt ggc agt gca aaa aga aat gag cgt ggc aaa gat ttc gac agg   192
35       Ile Ser Gly Ser Ala Lys Arg Asn Glu Arg Gly Lys Asp Phe Asp Arg
36           50              55                  60
37       aaa aga gac ggg aac ggt aga aaa cgt tgg aga gat tcc aga aga ctg   240
38       Lys Arg Asp Gly Asn Gly Arg Lys Arg Trp Arg Asp Ser Arg Arg Leu
39       65              70                  75                  80
40       att ttc att ctt ggt gca ttc tta ggt gta ctt ttg ccg ttt agc ttt   288
41       Ile Phe Ile Leu Gly Ala Phe Leu Gly Val Leu Leu Pro Phe Ser Phe
42                   85              90                  95
43       ggc gct tat cat gtt cat aat agc gat agc gac ttg ttt gac aac ttt   336
44       Gly Ala Tyr His Val His Asn Ser Asp Ser Asp Leu Phe Asp Asn Phe
```

```
45                   100              105              110
46     gta aat ttt gat tca ctt aaa gtg tat ttg gat gat tgg aaa gat gtt   384
47     Val Asn Phe Asp Ser Leu Lys Val Tyr Leu Asp Asp Trp Lys Asp Val
48         115              120              125
49     ctc cca caa ggt ata agt tcg ttt att gat gat att cag gct ggt aac   432
50     Leu Pro Gln Gly Ile Ser Ser Phe Ile Asp Asp Ile Gln Ala Gly Asn
51         130              135              140
52     tac tcc aca tct tct tta gat gat ctc agt gaa aat ttt gcc gtt ggt   480
53     Tyr Ser Thr Ser Ser Leu Asp Asp Leu Ser Glu Asn Phe Ala Val Gly
54     145              150              155              160
55     aaa caa ctc tta cgt gat tat aat atc gag gcc aaa cat cct gtt gta   528
56     Lys Gln Leu Leu Arg Asp Tyr Asn Ile Glu Ala Lys His Pro Val Val
57                   165              170              175
58     atg gtt cct ggt gtc att tct acg gga att gaa agc tgg gga gtt att   576
59     Met Val Pro Gly Val Ile Ser Thr Gly Ile Glu Ser Trp Gly Val Ile
60                   180              185              190
61     gga gac gat gag tgc gat agt tct gcg cat ttt cgt aaa cgg ctg tgg   624
62     Gly Asp Asp Glu Cys Asp Ser Ser Ala His Phe Arg Lys Arg Leu Trp
63         195              200              205
64     gga agt ttt tac atg ctg aga aca atg gtt atg gat aaa gtt tgt tgg   672
65     Gly Ser Phe Tyr Met Leu Arg Thr Met Val Met Asp Lys Val Cys Trp
66         210              215              220
67     ttg aaa cat gta atg tta gat cct gaa aca ggt ctg gac cca ccg aac   720
68     Leu Lys His Val Met Leu Asp Pro Glu Thr Gly Leu Asp Pro Pro Asn
69     225              230              235              240
70     ttt acg cta cgt gca gca cag ggc ttc gaa tca act gat tat ttc atc   768
71     Phe Thr Leu Arg Ala Ala Gln Gly Phe Glu Ser Thr Asp Tyr Phe Ile
72                   245              250              255
73     gca ggg tat tgg att tgg aac aaa gtt ttc caa aat ctg gga gta att   816
74     Ala Gly Tyr Trp Ile Trp Asn Lys Val Phe Gln Asn Leu Gly Val Ile
75                   260              265              270
76     ggc tat gaa ccc aat aaa atg acg agt gct gcg tat gat tgg agg ctt   864
77     Gly Tyr Glu Pro Asn Lys Met Thr Ser Ala Ala Tyr Asp Trp Arg Leu
78         275              280              285
79     gca tat tta gat cta gaa aga cgc gat agg tac ttt acg aag cta aag   912
80     Ala Tyr Leu Asp Leu Glu Arg Arg Asp Arg Tyr Phe Thr Lys Leu Lys
81         290              295              300
82     gaa caa atc gaa ctg ttt cat caa ttg agt ggt gaa aaa gtt tgt tta   960
83     Glu Gln Ile Glu Leu Phe His Gln Leu Ser Gly Glu Lys Val Cys Leu
84     305              310              315              320
85     att gga cat tct atg ggt tct cag att atc ttt tac ttt atg aaa tgg   1008
86     Ile Gly His Ser Met Gly Ser Gln Ile Ile Phe Tyr Phe Met Lys Trp
87                   325              330              335
88     gtc gag gct gaa ggc cct ctt tac ggt aat ggt ggt cgt ggc tgg gtt   1056
89     Val Glu Ala Glu Gly Pro Leu Tyr Gly Asn Gly Gly Arg Gly Trp Val
90                   340              345              350
91     aac gaa cac ata gat tca ttc att aat gca gca ggg acg ctt ctg ggc   1104
92     Asn Glu His Ile Asp Ser Phe Ile Asn Ala Ala Gly Thr Leu Leu Gly
93                   355              360              365
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RAW SEQUENCE LISTING   DATE: 09/22/2003
PATENT APPLICATION: **US/09/537,710C**   TIME: 13:26:07

Input Set : **N:\EBONY'S\US09537710C.RAW.txt**
Output Set: **N:\CRF4\09222003\I537710C.raw**

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 94     gct cca aag gca gtt cca gct cta att agt ggt gaa atg aaa gat acc    1152
 95     Ala Pro Lys Ala Val Pro Ala Leu Ile Ser Gly Glu Met Lys Asp Thr
 96         370                 375                 380
 97     att caa tta aat acg tta gcc atg tat ggt ttg gaa aag ttc ttc tca    1200
 98     Ile Gln Leu Asn Thr Leu Ala Met Tyr Gly Leu Glu Lys Phe Phe Ser
 99     385                 390                 395                 400
100     aga att gag aga gta aaa atg tta caa acg tgg ggt ggt ata cca tca    1248
101     Arg Ile Glu Arg Val Lys Met Leu Gln Thr Trp Gly Gly Ile Pro Ser
102                         405                 410                 415
103     atg cta cca aag gga gaa gag gtc att tgg ggg gat atg aag tca tct    1296
104     Met Leu Pro Lys Gly Glu Glu Val Ile Trp Gly Asp Met Lys Ser Ser
105                         420                 425                 430
106     tca gag gat gca ttg aat aac aac act gac aca tac ggc aat ttc att    1344
107     Ser Glu Asp Ala Leu Asn Asn Asn Thr Asp Thr Tyr Gly Asn Phe Ile
108                 435                 440                 445
109     cga ttt gaa agg aat acg agc gat gct ttc aac aaa aat ttg aca atg    1392
110     Arg Phe Glu Arg Asn Thr Ser Asp Ala Phe Asn Lys Asn Leu Thr Met
111         450                 455                 460
112     aaa gac gcc att aac atg aca tta tcg ata tca cct gaa tgg ctc caa    1440
113     Lys Asp Ala Ile Asn Met Thr Leu Ser Ile Ser Pro Glu Trp Leu Gln
114     465                 470                 475                 480
115     aga aga gta cat gag cag tac tcg ttc ggc tat tcc aag aat gaa gaa    1488
116     Arg Arg Val His Glu Gln Tyr Ser Phe Gly Tyr Ser Lys Asn Glu Glu
117                         485                 490                 495
118     gag tta aga aaa aat gag cta cac cac aag cac tgg tcg aat cca atg    1536
119     Glu Leu Arg Lys Asn Glu Leu His His Lys His Trp Ser Asn Pro Met
120                         500                 505                 510
121     gaa gta cca ctt cca gaa gct ccc cac atg aaa atc tat tgt ata tac    1584
122     Glu Val Pro Leu Pro Glu Ala Pro His Met Lys Ile Tyr Cys Ile Tyr
123                 515                 520                 525
124     ggg gtg aac aac cca act gaa agg gca tat gta tat aag gaa gag gat    1632
125     Gly Val Asn Asn Pro Thr Glu Arg Ala Tyr Val Tyr Lys Glu Glu Asp
126         530                 535                 540
127     gac tcc tct gct ctg aat ttg acc atc gac tac gaa agc aag caa cct    1680
128     Asp Ser Ser Ala Leu Asn Leu Thr Ile Asp Tyr Glu Ser Lys Gln Pro
129     545                 550                 555                 560
130     gta ttc ctc acc gag ggg gac gga acc gtt ccg ctc gtg gcg cat tca    1728
131     Val Phe Leu Thr Glu Gly Asp Gly Thr Val Pro Leu Val Ala His Ser
132                         565                 570                 575
133     atg tgt cac aaa tgg gcc cag ggt gct tca ccg tac aac cct gcc gga    1776
134     Met Cys His Lys Trp Ala Gln Gly Ala Ser Pro Tyr Asn Pro Ala Gly
135                 580                 585                 590
136     att aac gtt act att gtg gaa atg aaa cac cag cca gat cga ttt gat    1824
137     Ile Asn Val Thr Ile Val Glu Met Lys His Gln Pro Asp Arg Phe Asp
138         595                 600                 605
139     ata cgt ggt gga gca aaa agc gcc gaa cac gta gac atc ctc ggc agc    1872
140     Ile Arg Gly Gly Ala Lys Ser Ala Glu His Val Asp Ile Leu Gly Ser
141         610                 615                 620
142     gcg gag ttg aac gat tac atc ttg aaa att gca agc ggt aat ggc gat    1920
```

```
143        Ala Glu Leu Asn Asp Tyr Ile Leu Lys Ile Ala Ser Gly Asn Gly Asp
144        625             630             635             640
145        ctc gtc gag cca cgc caa ttg tct aat ttg agc cag tgg gtt tct cag   1968
146        Leu Val Glu Pro Arg Gln Leu Ser Asn Leu Ser Gln Trp Val Ser Gln
147                        645             650             655
148        atg ccc ttc cca atg taa                                           1986
149        Met Pro Phe Pro Met
150                        660
152 <210> SEQ ID NO: 2
153 <211> LENGTH: 661
154 <212> TYPE: PRT
155 <213> ORGANISM: Saccharomyces cerevisiae
156 <400> SEQUENCE: 2
157        Met Gly Thr Leu Phe Arg Arg Asn Val Gln Asn Gln Lys Ser Asp Ser
158         1               5               10              15
159        Asp Glu Asn Asn Lys Gly Gly Ser Val His Asn Lys Arg Glu Ser Arg
160                        20              25              30
161        Asn His Ile His His Gln Gln Gly Leu Gly His Lys Arg Arg Arg Gly
162                    35              40              45
163        Ile Ser Gly Ser Ala Lys Arg Asn Glu Arg Gly Lys Asp Phe Asp Arg
164            50              55              60
165        Lys Arg Asp Gly Asn Gly Arg Lys Arg Trp Arg Asp Ser Arg Arg Leu
166         65              70              75              80
167        Ile Phe Ile Leu Gly Ala Phe Leu Gly Val Leu Leu Pro Phe Ser Phe
168                        85              90              95
169        Gly Ala Tyr His Val His Asn Ser Asp Ser Asp Leu Phe Asp Asn Phe
170                    100             105             110
171        Val Asn Phe Asp Ser Leu Lys Val Tyr Leu Asp Asp Trp Lys Asp Val
172                    115             120             125
173        Leu Pro Gln Gly Ile Ser Ser Phe Ile Asp Asp Ile Gln Ala Gly Asn
174            130             135             140
175        Tyr Ser Thr Ser Ser Leu Asp Asp Leu Ser Glu Asn Phe Ala Val Gly
176        145             150             155             160
177        Lys Gln Leu Leu Arg Asp Tyr Asn Ile Glu Ala Lys His Pro Val Val
178                        165             170             175
179        Met Val Pro Gly Val Ile Ser Thr Gly Ile Glu Ser Trp Gly Val Ile
180                    180             185             190
181        Gly Asp Asp Glu Cys Asp Ser Ser Ala His Phe Arg Lys Arg Leu Trp
182                    195             200             205
183        Gly Ser Phe Tyr Met Leu Arg Thr Met Val Met Asp Lys Val Cys Trp
184            210             215             220
185        Leu Lys His Val Met Leu Asp Pro Glu Thr Gly Leu Asp Pro Pro Asn
186        225             230             235             240
187        Phe Thr Leu Arg Ala Ala Gln Gly Phe Glu Ser Thr Asp Tyr Phe Ile
188                        245             250             255
189        Ala Gly Tyr Trp Ile Trp Asn Lys Val Phe Gln Asn Leu Gly Val Ile
190                    260             265             270
191        Gly Tyr Glu Pro Asn Lys Met Thr Ser Ala Ala Tyr Asp Trp Arg Leu
192                    275             280             285
```

```
193      · Ala Tyr Leu Asp Leu Glu Arg Arg Asp Arg Tyr Phe Thr Lys Leu Lys
194          290                 · 295                 300
195        Glu Gln Ile Glu Leu Phe His Gln Leu Ser Gly Glu Lys Val Cys Leu
196        305                 310                 315                 320
197        Ile Gly His Ser Met Gly Ser Gln Ile Ile Phe Tyr Phe Met Lys Trp
198                            325                 330                 335
199        Val Glu Ala Glu Gly Pro Leu Tyr Gly Asn Gly Gly Arg Gly Trp Val
200                            340                 345                 350
201        Asn Glu His Ile Asp Ser Phe Ile Asn Ala Ala Gly Thr Leu Leu Gly
202                    355                 360                 365
203        Ala Pro Lys Ala Val Pro Ala Leu Ile Ser Gly Glu Met Lys Asp Thr
204            370                 375                 380
205        Ile Gln Leu Asn Thr Leu Ala Met Tyr Gly Leu Glu Lys Phe Phe Ser
206        385                 390                 395                 400
207        Arg Ile Glu Arg Val Lys Met Leu Gln Thr Trp Gly Gly Ile Pro Ser
208                            405                 410                 415
209        Met Leu Pro Lys Gly Glu Glu Val Ile Trp Gly Asp Met Lys Ser Ser
210                        420                 425                 430
211        Ser Glu Asp Ala Leu Asn Asn Asn Thr Asp Thr Tyr Gly Asn Phe Ile
212                    435                 440                 445
213        Arg Phe Glu Arg Asn Thr Ser Asp Ala Phe Asn Lys Asn Leu Thr Met
214            450                 455                 460
215        Lys Asp Ala Ile Asn Met Thr Leu Ser Ile Ser Pro Glu Trp Leu Gln
216        465                 470                 475                 480
217        Arg Arg Val His Glu Gln Tyr Ser Phe Gly Tyr Ser Lys Asn Glu Glu
218                    485                 490                 495
219        Glu Leu Arg Lys Asn Glu Leu His His Lys His Trp Ser Asn Pro Met
220                    500                 505                 510
221        Glu Val Pro Leu Pro Glu Ala Pro His Met Lys Ile Tyr Cys Ile Tyr
222            515                 520                 525
223        Gly Val Asn Asn Pro Thr Glu Arg Ala Tyr Val Tyr Lys Glu Glu Asp
224            530                 535                 540
225        Asp Ser Ser Ala Leu Asn Leu Thr Ile Asp Tyr Glu Ser Lys Gln Pro
226        545                 550                 555                 560
227        Val Phe Leu Thr Glu Gly Asp Gly Thr Val Pro Leu Val Ala His Ser
228                        565                 570                 575
229        Met Cys His Lys Trp Ala Gln Gly Ala Ser Pro Tyr Asn Pro Ala Gly
230                    580                 585                 590
231        Ile Asn Val Thr Ile Val Glu Met Lys His Gln Pro Asp Arg Phe Asp
232                595                 600                 605
233        Ile Arg Gly Gly Ala Lys Ser Ala Glu His Val Asp Ile Leu Gly Ser
234            610                 615                 620  .
235        Ala Glu Leu Asn Asp Tyr Ile Leu Lys Ile Ala Ser Gly Asn Gly Asp
236        625                 630                 635                 640
237        Leu Val Glu Pro Arg Gln Leu Ser Asn Leu Ser Gln Trp Val Ser Gln
238                    645                 650  ·       ·       655
239        Met Pro Phe Pro Met
240                    660
242 <210> SEQ ID NO: 3
```

RAW SEQUENCE LISTING ERROR SUMMARY   DATE: 09/22/2003
PATENT APPLICATION: US/09/537,710C   TIME: 13:26:08

Input Set : **N:\EBONY'S\US09537710C.RAW.txt**
Output Set: **N:\CRF4\09222003\I537710C.raw**

<u>Please Note:</u>
Use of n and/or Xaa have been detected in the Sequence Listing. Please review the
Sequence Listing to ensure that a corresponding explanation is presented in the <220>
to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:5; N Pos. 2363
Seq#:7; N Pos. 601,627
Seq#:7; Xaa Pos. 116,121
Seq#:9; N Pos. 15,45,83,103,107,112,210
Seq#:18; N Pos. 240,385
Seq#:18; Xaa Pos. 41,89
Seq#:19; N Pos. 15,45,83,103,107,112,210

<u>Invalid Line Length:</u>
The rules require that a line not exceed 72 characters in length. This includes spaces.

Seq#:1; Line(s) 6

VERIFICATION SUMMARY   DATE: 09/22/2003
PATENT APPLICATION: **US/09/537,710C**   TIME: 13:26:08

Input Set : **N:\EBONY'S\US09537710C.RAW.txt**
Output Set: **N:\CRF4\09222003\I537710C.raw**

```
L:10 M:270 C: Current Application Number differs, Wrong Format
L:403 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5 after pos.:2340
L:534 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7 after pos.:384
M:341 Repeated in SeqNo=7
L:575 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:0
M:341 Repeated in SeqNo=9
L:1065 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:18 after pos.:215
M:341 Repeated in SeqNo=18
L:1087 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:19 after pos.:0
M:341 Repeated in SeqNo=19
```

STATISTICS SUMMARY   DATE: 09/22/2003
PATENT APPLICATION: **US/09/537,710C**   TIME: 13:26:08

Input Set : **N:\EBONY'S\US09537710C.RAW.txt**
Output Set: **N:\CRF4\09222003\I537710C.raw**

Application Serial Number: US/09/537,710C
Alpha or Numeric or Xml: Numeric
Application Class:
Application File Date: 03-30-2000
Art Unit: 1600
Software Application: WORDPERFECT
Total Number of Sequences: 19
Total Nucleotides: 18754
Total Amino Acids: 3830
Number of Errors: 0
Number of Warnings: 14
Number of Corrections: 1

MESSAGE SUMMARY

270 C: 1 (Current Application Number differs)
341 W: 14 ((46) "n" or "Xaa" used)